

REMARKS

Applicants have amended the claims to overcome the Examiner's objections and rejections set out in the most recent office action. Claims 47 – 60 are presently pending.

Claims 47 and 54 have been amended to overcome the Examiner's objections concerning language pertaining to "computer readable medium" and "order and type".

Support for the inclusion of computer readable medium can be found in figure 1 which includes a plurality of query servers 4. Each query server 4 is shown with an associated database or storage media icon attached to the server clearly indicating the existence of a computer readable medium even if not specifically called out by name in the specification. Moreover, the description states that the invention may be implemented on a networked computer system (See, ¶ [0016] of the published application). One of ordinary skill in the art would, under a totality of the circumstances, readily and easily determine that a computer readable medium would be an inherent element of the invention given the network architecture shown in figure 1.

References to "order" and "type" have been removed from the claims.

35 USC § 101 Rejection

Claims 54 -60 have been amended to include the word tangible to modify the phrase computer readable medium. Thus, the Examiner's concern that the claims could

encompass a “signal” under the broadest interpretation is mooted since a signal is not tangible. Reconsideration and withdrawal of this rejection is requested.

Examiner’s Comments Regarding Allowable Subject Matter

The Examiner has indicated that independent claims 47 and 54 could potentially be allowable if Applicant were to elaborate upon terms such as “table of predetermined question patterns” and “affirmative statement”.

Applicant has amended independent claims 47 and 54 to further modify the term affirmative statement thusly:

transforming the question pattern into an affirmative statement pattern that is parallel in structure to an answer to the user supplied natural language question and includes: (i) syntactic and morphological categories; and (ii) the at least one partially unspecified term;

as well as further defining the table of predetermined question patterns thusly:

wherein the table of predetermined question patterns is comprised of a set of phrases that have been derived through transformations to have a different structure but the same informational content as a specific declarative sentence or an appropriate question word substituted in the phrase;

Support for the amendments above can be found in ¶ [0030] and ¶ [0042] of the published application and further defines the features and structure of the “affirmative statement pattern” and “table of predetermined question patterns” in a manner that further distinguishes the claim(s) from the cited prior art of Brown. To the Examiner’s comments, the affirmative statement is grammatically structured in a manner that an

expected answer would appear in the text of the searched documents and is comprised of syntactic and morphological categories and the at least one partially unspecified term.

Moreover, the syntactic and morphological categories are not words themselves but representations of types of words which are then replaced with corresponding terms from the original natural language question query (See, ¶ [0092] of the published application).

35 USC § 102(e) Rejection Based on U.S. Pat. No. 6,665,666 to Brown

The prior art of record differs significantly from the claimed system of answering a question of the present invention. Brown and the present application differ both in intent and execution in means and methods that are patentably distinct from one another.

The intent of Brown is to provide a hit-list of documents that presumably satisfy a search query where the query is in the form of a natural language question containing a question word. Question words include words such as who, what, where, when, how much, etc. The intent of the present application is somewhat different. The present application seeks to fulfill an information need (answer a question) of a search query. The claimed output or result of the present application is not a hit-list of documents presumably containing the answer to the query but rather one or more answers to the query. This difference is distinct enough that Brown expressly disclaimed the concept in the '666 patent wherein it is stated, "[t]he issues of determining a single answer

phrase from a set of returned text passages is **not** covered by this disclosure.” *{emphasis added}* (see Brown, col. 9, lns. 60-64). This passage alone is sufficient to disqualify Brown as prior art with respect to the present application.

In addition to having a different intent, Brown and the present application also differ patentably in the execution.

Under an embodiment of the present invention described in the specification, an analyzed question is generated by subjecting a question to syntactic and morphological analysis, which assigns syntactic and/or morphological categories to portions of the question. (See ¶ [0039] of the published application.) For example, syntactic and morphological analysis of the question “Who did the boy see?” generates the analyzed question: “(*WH who) (*AUX did) (*NP (*DET the) (*N boy)) (*V see)?” (See ¶ [0073] – ¶ [0075] of the published application). The assigned capitalized categories are question word (WH), auxiliary verb (AUX), noun phrase (NP), determiner (DET), noun (N), and verb (V). (See ¶ [0053] – ¶ [0070] of the published application.)

Once the analyzed question is generated, the question terms and instances of the auxiliary verb morphological category are ignored. For example, the analyzed question above becomes “WH NP V” and is used to identify a predetermined question pattern, such as “WH1 NP0 V,” from a table of predetermined question patterns. (See ¶ [0076] – ¶ [0079] of the published application.) The predetermined question pattern is then used to identify predetermined affirmative statement patterns such as “NP0 V NP1” and “NP1 REL NP0 V.” (See ¶ [0081] for the complete set for this example.)

These predetermined affirmative statement patterns, expressed in terms of syntactic and/or morphological categories, have structures that correspond to appropriate answers to the question. (See ¶ [0040] of the published application.) The predetermined statement patterns represent potential statement structures for actual answers in the body of information being searched. The set of predetermined statement patterns are then modified by replacing the instances of syntactic and morphological criteria with words from the question and a partially unspecified term, yielding partially unspecified queries such as “the boy saw [NHUM]” and “[NHUM] who the boy saw.” (See ¶ [0082] - ¶ [0101] of the published application.) The partially unspecified term “[NHUM]” restricts the matches for that term to human nouns since the question word of the question was “who,” indicating the answer to be a person.

The present invention uses the syntactical and/or morphological characteristics of the words in a question to identify a predetermined question pattern **and** corresponding predetermined statement patterns. The predetermined statement patterns, expressed in terms of syntactic and/or morphological categories, have structures corresponding to appropriate answers to the question. The identification of an appropriate predetermined question pattern and corresponding predetermined statement patterns is based only on the syntactic and/or morphological characteristics of the words of the original question and not the specific words themselves.

Brown also takes as input a query. However, the query must include a question word (see Brown , Fig. 3, ref # 332) that is replaced with a QA-token. For instance the query “when did the challenger explode” results in a QA token of TIME\$ and/or

DATE\$ since the word “when” implies time and results to the query (in bold) will likely include a reference to a time or a date such as, for instance, “The space shuttle **Challenger exploded on the morning of January 28, 1986**” which contains both a reference to time (morning) and date (January 28, 1986). The original query “when did the Challenger explode” is converted to a query that looks like {@SYN(TIME\$, DATE\$) Challenger explode}. Thus the original query gets translated on query analysis to the bag of words{@SYN(TIME\$, DATE\$) Challenger explode}(see Brown, col. 5, Ins. 58-66).

This bag of words is then used against the database of documents to find matches within a specified window of sentences. (see Brown, col. 16, Ins. 5-12). There is no attempt or teaching of identifying affirmative statement patterns that the answer would employ. Any matches found by Brown are returned as a hit-list of documents not as an answer to the original query as is described and claimed in the present application.

Thus, Brown does not teach parsing the question (query) into a series of syntactic or morphological categories in order to derive a likely statement pattern for the answer. The data representing a QA-token may arguably be characterized as a syntactic category but the remainder of the query is not parsed into a “series” of syntactic categories. Nor does Brown generate an analyzed question comprised of the syntactic categories of the parsed question. Brown’s analyzed query for the example “When did the Challenger explode” gets translated on query analysis to the bag of words{@SYN(TIME\$, DATE\$) Challenger explode}(see Brown, col. 5, Ins. 58-66). This

analyzed question (query) clearly is not comprised exclusively of syntactic categories since it contains the actual search terms “Challenger” and “explode”.

Even giving Brown a generous reading on the “generating an analyzed query ...” step of the present application, Brown essentially stops there and submits the “bag of words” for matching against a body of documents. Thus, Brown simply does not perform the steps claimed in the present application of: *generating an analyzed question comprised of syntactic and morphological categories derived from the user supplied natural language question; determining which question pattern from a table of predetermined questions patterns corresponds to the analyzed question by matching the order and type of syntactic and morphological categories derived from the user supplied natural language question to the order and type of syntactic and morphological categories of the predetermined question patterns wherein the table of predetermined question patterns is comprised of a set of phrases that have been derived through transformations to have a different structure but the same informational content as a specific declarative sentence or an appropriate question word substituted in the phrase; replacing the question word with at least one partially unspecified term that is conceptually related to the question word and the answer; transforming the question pattern into an affirmative statement pattern that is parallel in structure to an answer to the user supplied natural language question and includes: (i) syntactic and morphological categories; and (ii) the at least one partially unspecified term; or generating a partially unspecified query based on the affirmative statement pattern, the partially unspecified query containing the at least one partially unspecified term.*

Lastly, the results or output of Brown is a hit-list of documents while the claimed output of the present application is an *answer* to the question.

Brown describes a pattern file having “character” and “detail” columns containing specific strings, or words, and a column for corresponding “QA-Tokens.” (See Fig. 3 of Brown.) Brown discloses testing the question string to see if it contains the specific string from the “character” column, or a concatenated string composed of the string from the “character” column and the string from the “detail” column if the latter exists, for each row of the pattern file. (See col. 10, ll. 47-66.) Where one or more matches are found, corresponding QA-Tokens are identified. A “bag of words” consisting of QA-Tokens and some or all of the words of the question is submitted to search for the answer. (See Brown col. 9, ll. 56-59.) Therefore, Brown forms a query, or “bag of words,” by matching specific words from a pattern file to portions of the original question. Brown does not generate partially unspecified queries through identifying an appropriate predetermined question pattern and corresponding predetermined statement patterns based only on the syntactic and/or morphological characteristics of the original question and not the specific words of the question.

Brown does not disclose question analysis that parses, identifies, and assigns syntactic or morphological categories to portions of the question, or any use of syntactic or morphological categories in the process of creating a query. In stark contrast, the present invention generates an analyzed question that specifically identifies syntactic or morphological categories such as noun phrase (NP) and assigns the categories to portions of the question, as demonstrated in the example analyzed question.

Similarly, Brown does not teach or suggest identifying predetermined question patterns within the analyzed question. As discussed above, Brown discloses testing the question to see if specific words or phrases from a pattern file are located *in the question*. On the other hand, the predetermined question pattern of the present invention is a pattern of syntactic and morphological categories as exemplified by “WH1 NP0 V.” not of the words themselves. (See ¶ [0078] - ¶ [0079] of the published application.)

In view of the above remarks, Applicant asserts that Brown fails to teach each and every element and/or step of the claims as currently drafted. Therefore, Applicant requests reconsideration and withdrawal of the 35 USC 102(e) rejection.

Applicant believes that all of the Examiner’s objections and rejections have been addressed and overcome and requests that all such objections and rejections be withdrawn.

Respectfully submitted,

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